CLAIMS

1. (currently amended) A data recorder comprising:

an angular rate sensor producing an angular rate sensor output;

a processor coupled to the angular rate sensor; ~~and~~

a memory coupled to the processor for storing the angular rate sensor output; and

an angular rate filter coupled between the angular rate sensor and the processor for allowing the angular rate sensor output to reach the processor only when the angular rate sensor output is within a frequency range.

2. (currently amended) The data recorder of claim ~~1~~ 57 further comprising a comparing means for comparing the angular rate sensor output with an angular rate threshold.

3. (original) The data recorder of claim 2 further comprising storing means for storing the angular rate sensor output in the memory if the angular rate sensor output is greater than the angular rate threshold.

4. (original) The data recorder of claim 2 where the processor is configured to store the angular rate sensor output in the memory if the angular rate sensor output is greater than the angular rate threshold.

5. (original) The data recorder of claim 4 further comprising continuous sampling means for continuously sampling the angular rate sensor output.

6. (original) The data recorder of claim 4 where the processor is configured to continuously sample the angular rate sensor output.

7. (cancelled)

8. (currently amended) The data recorder of claim ~~[7]~~ 6 further comprising a gain circuit for amplifying the angular rate sensor output.

9. (original) The data recorder of claim 8 further comprising an analog-to-digital converter coupled to the angular rate sensor output for converting the angular rate sensor output to a digital value.

10. (original) The data recorder of claim 9 further comprising a linear accelerometer producing a linear accelerometer output.

11. (original) The data recorder of claim 10 further comprising a comparator for comparing the linear accelerometer output with a linear acceleration threshold.

12. (original) The data recorder of claim 11 where the processor is configured to store the linear accelerometer output in the memory if the linear accelerometer output exceeds the linear acceleration threshold.

13. (currently amended) The data recorder of claim 12 including a humidity sensor, the humidity sensor producing a humidity sensor output, and the processor is configured to store the humidity sensor output in the memory.

14. (currently amended) The data recorder of claim 13 including a temperature sensor, the temperature sensor producing a temperature sensor output, and the processor is configured to store the temperature sensor output in the memory.

15. (original) The data recorder of claim 14 including a data communication interface.

16. (original) The data recorder of claim 15 where the processor is configured to receive information from the data communication interface and the processor is configured to transmit information through the data communication interface.

17. (currently amended) A data recorder comprising:

a first linear accelerometer producing a first linear accelerometer output;

a first angular rate sensor producing a first angular rate sensor output;

a memory;

~~and~~ a processor coupled to the first linear accelerometer, the first angular rate sensor and the memory, the processor configured to store the first linear accelerometer output and the first angular rate sensor output in the memory;

a first linear accelerometer filter for allowing the first linear accelerometer output to reach the processor if the first linear accelerometer output is within a first frequency range; and

a first angular rate sensor filter for allowing the first angular rate sensor output to reach the processor if the first angular rate sensor output is within a second frequency range.

18. (currently amended) The data recorder of claim 17 ~~further comprising~~ where the [a] first ~~linear accelerometer filter~~ frequency range and the second frequency range are programmable by ~~for allowing only first linear accelerometer outputs within a frequency range to reach~~ the processor.

19. (cancelled)

20. (currently amended) The data recorder of claim ~~19~~ 18 further comprising a first angular rate sensor gain circuit coupled to the first angular rate sensor output for amplifying the first angular rate sensor output and a first linear accelerometer gain circuit coupled to the first linear accelerometer output for amplifying the first linear accelerometer output.

21. (currently amended) A data recorder comprising:

an X-axis linear accelerometer producing an X-axis linear accelerometer output;

a Y-axis linear accelerometer producing a Y-axis linear accelerometer output;

a Z-axis linear accelerometer producing a Z-axis linear accelerometer output;

a roll angular rate sensor producing a roll angular rate sensor output;

a pitch angular rate sensor producing a pitch angular rate sensor output;

a yaw angular rate sensor producing a yaw angular rate sensor output;

a memory; ~~and~~

a processor;

a roll filter coupled between the roll angular rate sensor and the processor to allow the roll filter output to reach the processor only if the roll filter output is within a frequency range;

a pitch filter coupled between the pitch angular rate sensor and the processor to allow the pitch filter output to reach the processor only if the pitch filter output is within the frequency range; and

a yaw filter coupled between the yaw angular rate sensor and the processor to allow the yaw filter output to reach the processor only if the yaw filter output is within a frequency range;

wherein the processor is configured to ~~continuously~~ monitor the X-axis linear accelerometer, the Y-axis linear accelerometer, the Z-axis linear accelerometer, the roll angular rate sensor, the pitch angular rate sensor and the yaw angular rate sensor and to store in the memory the X-axis linear accelerometer output, the Y-axis linear accelerometer output, the Z-axis linear accelerometer output, the roll angular rate sensor output, and the pitch angular rate

sensor output ~~if the pitch angular rate sensor and the yaw angular rate sensor output~~ if one of the X-axis linear accelerometer output, the Y-axis linear accelerometer output, the Z-axis linear accelerometer output, the roll angular rate sensor output, the pitch angular rate sensor output ~~or~~ and the yaw angular rate sensor output exceed a pre-determined threshold.

22. (original) The data recorder of claim 21 where the processor is configured to store in the memory a time stamp.

23. (currently amended) The data recorder of claim 22 where an X-axis filter is coupled to the X-axis linear accelerometer, a Y-axis filter is coupled to the Y-axis linear accelerometer, and a Z-axis filter is coupled to the Z-axis linear accelerometer~~, a roll filter is coupled to the roll angular rate sensor, a pitch filter is coupled to the pitch angular rate sensor, and a yaw filter is coupled to the yaw angular rate sensor~~.

24. (original) The data recorder of claim 23 where an X-axis gain circuit is coupled to the X-axis filter, a Y-axis gain circuit is coupled to the Y-axis filter, a Z-axis gain circuit is coupled to the Z-axis filter, a roll gain circuit is connected to the roll filter, a pitch gain circuit is connected to the pitch filter, and a yaw gain circuit is connected to the yaw filter.

25. (currently amended) A method of operating a self-contained data recorder, the self-contained data recorder having a housing, an angular rate sensor with an angular rate sensor output, a processor, an angular rate sensor between the angular rate sensor and the processor for allowing the angular rate sensor output to reach the processor only if the angular rate sensor output is within a frequency range, a memory, and a power supply comprising the steps of:

~~continuously~~ sampling the angular rate sensor output;

comparing the angular rate sensor output with a threshold;

and, if the angular rate sensor output is greater than the threshold, storing a plurality of angular rate sensor outputs in the memory.

26. (original) The method of claim 25 further comprising the step of storing a plurality of angular sensor date stamps with the plurality of angular rate sensor outputs.

27. (original) The method of claim 26 further comprising the step of ceasing the storing of the plurality of angular rate sensor outputs in the memory if the angular rate sensor output falls below the threshold.

28. (original) The method of claim 27 further comprising the step of ceasing the storing of the plurality of angular rate sensor outputs in the memory if the storing of the plurality of angular rate sensor outputs exceeds a first time limit.

29. (original) The method of claim 28 further comprising the step of prohibiting the storing of a plurality of angular rate sensor outputs for a first period of time when the storing of the plurality of angular rate sensor outputs exceeds the first time limit.

30. (currently amended) The method of claim 29 where the self-contained data recorder has a linear accelerometer, the linear accelerometer having a linear accelerometer output, further comprising the steps of:

continuously sampling ~~a~~ the linear accelerometer output;

comparing the linear accelerometer output with a threshold; and if the linear accelerometer output is greater than the threshold, storing a plurality of linear accelerometer outputs in the memory.

31. (currently amended) The method of claim 30 further comprising the step of ceasing the storing of the plurality of linear acceleration outputs ~~series~~ in the memory if the linear acceleration output falls below the linear accelerometer threshold.

32. (original) The method of claim 31 further comprising the step of ceasing the storing of the plurality of linear accelerometer outputs in the memory if the storing of the plurality of linear accelerometer outputs exceeds a second time limit.

33. (currently amended) The method of claim 32 further comprising ~~the step of~~ the step of prohibiting the storing of the plurality of linear accelerometer outputs for a second period of time if the storing of the plurality of linear accelerometer outputs exceeds the second time limit.

34. (original) The method of claim 33 further comprising the step of recalibrating the linear accelerometer after ceasing the storing of the plurality of the linear acceleration outputs.

35. (currently amended) A self contained data recorder comprising:

a housing;

a first linear accelerometer contained within the housing and producing a first linear accelerometer output;

a second linear accelerometer contained within the housing and producing a second linear accelerometer output;

a third linear accelerometer contained within the housing and producing a third linear accelerometer output;

a first angular rate sensor contained within the housing and producing a first angular rate sensor output;

a second angular rate sensor contained within the housing and producing a second angular rate sensor output;

a third angular rate sensor contained within the housing and producing a third angular rate sensor output;

a memory contained within the housing;

a processor contained within the housing;

a first angular rate sensor filter coupled between the processor and the first angular rate sensor for allowing the first angular rate sensor output to reach the processor if the first angular rate sensor output is within a frequency range;

a second angular rate sensor filter coupled between the processor and the second angular rate sensor for allowing the second angular rate sensor output to reach the processor if the second angular rate sensor output is within the frequency range;

a third angular rate sensor filter coupled between the processor and the third angular rate sensor for allowing the third angular rate sensor output to reach the processor if the third angular rate sensor output is within the frequency range; and

and a power supply contained with the housing;

~~and~~ wherein the processor is configured to store in the memory either the first linear accelerometer output, the second linear accelerometer output, the third linear accelerometer output, the first angular rate sensor output, the second angular rate sensor output, or the third angular rate sensor output;

~~and a power supply contained with the housing~~.

36. (original) The data recorder of claim 35 where the first angular rate sensor measures a first angular rate about a first angular rate sensor axis, the second angular rate sensor measures a second angular rate about a second angular rate sensor axis, and the third angular rate sensor measures a third angular rate about a third angular rate sensor axis, and the first angular rate sensor axis, the second angular rate sensor axis and the third angular rate sensor axis are substantially orthogonal.

37. (original) The data recorder of claim 36 where the first linear accelerometer measures a first linear acceleration along a first linear acceleration axis, the second linear accelerometer measures a second linear acceleration along a second linear acceleration axis and the third linear accelerometer measures a third linear acceleration along a third linear acceleration axis, and where the first linear acceleration axis, the second linear acceleration axis and the third linear acceleration axis are substantially orthogonal.

38. (original) The data recorder of claim 37 where the first linear acceleration axis and the first angular rate sensor axis are substantially collinear, the second linear acceleration axis and the second angular rate sensor axis are substantially collinear, and the third linear acceleration axis and the third angular rate sensor axis are substantially collinear.

39. (original) The data recorder of claim 38 further including a clock for generating a time stamp.

40. (original) The data recorder of claim 39 where the processor is configured to store the time stamp in the memory when the processor stores in the memory the first linear accelerometer output, the second linear accelerometer output, the third linear accelerometer

output, the first angular rate sensor output, the second angular rate sensor output, or the third angular rate sensor output.

41. (original) The data recorder of claim 40 where the processor is configured to store the first linear accelerometer output, the second linear accelerometer output, the third linear accelerometer output, the first angular rate sensor output, the second angular rate sensor output, or the third angular rate sensor output only when the first linear accelerometer output, the second linear accelerometer output, the third linear accelerometer output, the first angular rate sensor output, the second angular rate sensor output, or the third angular rate sensor output exceed a threshold.

42. (original) The data recorder of claim 41 where the processor is configured to continuously store the first linear accelerometer output, the second linear accelerometer output, the third linear accelerometer output, the first angular rate sensor output, the second angular rate sensor output, or the third angular rate sensor output only when the first linear accelerometer output, the second linear accelerometer output, the third linear accelerometer output, the first angular rate sensor output, the second angular rate sensor output, or the third angular rate sensor output exceeds the threshold.

43. (cancelled)

44. (currently amended) The data recorder of claim ~~43~~ 42 where the processor is configured to stop storing the first linear accelerometer output, the second linear accelerometer output, the third linear accelerometer output, the first angular rate sensor output, the second angular rate sensor output, or the third angular rate sensor output after a select period of time.

45. (original) The data recorder of claim 44 where the processor is configured to calculate a velocity change from the first linear accelerometer output, the second linear accelerometer output and the third linear accelerometer output.

46. (original) The data recorder of claim 45 where the processor is configured to determine a peak linear acceleration from the first linear accelerometer output, the second linear accelerometer output and the third linear accelerometer output.

47. (original) The data recorder of claim 46 further comprising a humidity sensor producing a humidity sensor output and a temperature sensor producing a temperature sensor output, where the humidity sensor and the temperature sensor are contained within the housing and where the processor is configured to store the humidity sensor output and the temperature sensor output.

48. (original) The data recorder of claim 47 further comprising a communication interface contained substantially within the housing allowing for communication of the data recorder with external devices.

49. (original) The data recorder of claim 48 where the communication interface includes a wireless communication device.

50.-56. (cancelled)

57. (new) The data recorder of claim 1 where the angular rate sensor is programmable.

58. (new) The data recorder of claim 57 where the angular rate sensor is programmable by one of the processor and a data communication interface.